

VI. What Is Claimed Is:

1 1. A method of scheduling the transmission of data from
2 an access point to a plurality of access terminals serviced by
3 the access point using the corresponding forward communication
4 links between the access point and the access terminals in a
5 CDMA/HDR communications network, comprising:

6 the access point calculating a scheduling parameter for
7 each of the forward communication links and access
8 terminals as a function of a plurality of operating
9 parameters; and
10 the access point scheduling data for transmission to the
11 access terminal having the largest scheduling
12 parameter.

1 2. The method of claim 1, wherein the access point
2 calculates the scheduling parameter for each of the forward
3 communication links and access terminals as a function of a frame
4 utilization for the corresponding forward communication link and
5 access terminal.

1 3. The method of claim 2, wherein the frame utilization
2 is calculated as a function of a size of a data payload available
3 to send to the corresponding access terminal and a size of the
4 physical layer packet for the corresponding access terminal.

1 4. The method of claim 2, wherein the access point
2 calculates the frame utilization U_{FRAMEi} for the i th forward
3 communication link and access terminal using the following
4 expression:

$$U_{FRAMEi} = DPA_i / PS_i ;$$

[illegible]

8 to the i th access terminal;
9 and
10 PS_i = the physical layer packet
11 size corresponding to a
12 maximum data transmission
13 rate for the i th access
14 terminal.

1 5. The method of claim 2, wherein the access point
2 calculates the scheduling parameter for each of the forward
3 communication links and access terminals as a function of the
4 frame utilization, a maximum data transmission rate, and an
5 average data transmission rate for the corresponding forward
6 communication link and access terminal.

1 6. The method of claim 5, wherein the frame utilization
2 is calculated as a function of a size of a data payload available
3 to send to the corresponding access terminal and a size of the
4 physical layer packet for the corresponding access terminal.

1 7. The method of claim 5, wherein the access point
2 calculates the frame utilization U_{FRAMEi} for the i th forward
3 communication link and access terminal using the following
4 expression:

5
$$U_{FRAMEi} = DPA_i / PS_i;$$

6 wherein DPA_i = the size of the data
7 payload available to send
8 to the i th access terminal;
9 and
10 PS_i = the physical layer packet
11 size corresponding to a
12 maximum data transmission
13 rate for the i th access
14 terminal.

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1 10. The method of claim 1, wherein the access point
2 calculates the scheduling parameter for each of the forward
3 communication links and access terminals as a function of a
4 priority of the data to be sent to the corresponding access
5 terminal.

1 11. The method of claim 1, wherein the access point
2 calculates a scheduling parameter P_i for an i th access terminal
3 and forward communication link using the following expression:

5 wherein P_i = the scheduling parameter for the
6 ith forward communication link
7 for the corresponding ith access
8 terminal;
9 R_{MAXi} = the maximum data transmission
10 rate for the ith forward
11 communication link for the
12 corresponding ith access
13 terminal;

14 R_{AVGi} = the average data transmission
15 rate for the i th forward
16 communication link for the i th
17 corresponding i th access
18 terminal for a predetermined
19 time period; and
20 U_{FRAMEi} = the frame utilization for the i th
21 forward communication link for the
22 corresponding i th access terminal.

1 12. The method of claim 11, wherein the access point
2 calculates the frame utilization U_{FRAMEi} for the i th forward
3 communication link and access terminal using the following
4 expression:

5
$$U_{FRAMEi} = DPA_i / PS_i;$$

6 wherein DPA_i = the size of the data
7 payload available to send
8 to the i th access terminal;
9 and
10 PS_i = the physical layer packet
11 size corresponding to R_{MAXi} .

1 13. A communications network, comprising:
2 a plurality of access terminals; and
3 an access point operably coupled to the access terminals by
4 a plurality of corresponding forward communication
5 links;
6 wherein the access point is adapted to calculate a
7 scheduling parameter for each of the forward
8 communication links and access terminals as a function
9 of a plurality of operating parameters; and

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1 wherein the access point is adapted to schedule data for
2 transmission to the access terminal having the largest
3 scheduling parameter.

1 14. The communications network of claim 13, wherein the
2 access point is adapted to calculate the scheduling parameter for
3 each of the forward communication links and access terminals as a
4 function of a frame utilization for the corresponding forward
5 communication link and access terminal.

1 15. The communications network of claim 14, wherein the
2 frame utilization is calculated as a function of a size of a data
3 payload available to send to the corresponding access terminal
4 and a size of the physical layer packet for the corresponding
5 access terminal.

1 16. The communications network of claim 14, wherein the
2 access point is adapted to calculate the frame utilization U_{FRAMEi}
3 for the i th forward communication link and access terminal using
4 the following expression:

$$U_{FRAMEi} = DPA_i / PS_i;$$

wherein

DPA_i

= the size of the data
payload available to send
to the *i*th access terminal;
and

PS_i

= the physical layer packet
size corresponding to a
maximum data transmission
rate for the *i*th access
terminal.

1 17. The communications network of claim 14, wherein the
2 access point is adapted to calculate the scheduling parameter for
3 each of the forward communication links and access terminals as a

4 function of the frame utilization, a maximum data transmission
5 rate, and an average data transmission rate for the corresponding
6 forward communication link and access terminal.

1 18. The communications network of claim 17, wherein the
2 frame utilization is calculated as a function of a size of a data
3 payload available to send to the corresponding access terminal
4 and a size of the physical layer packet for the corresponding
5 access terminal.

1 19. The communications network of claim 17, wherein the
2 access point is adapted to calculate the frame utilization U_{FRAMEi}
3 for the i th forward communication link and access terminal using
4 the following expression:

$$U_{FRAMEi} = DPA_i / PS_i;$$

[illegible]

20. The communications network of claim 13, wherein the access point is adapted to calculate the scheduling parameter for each of the forward communication links and access terminals as a function of one or more weighting factors, a maximum data transmission rate, and an average data transmission rate for the corresponding forward communication link and access terminal.

1 21. The communications network of claim 20, wherein the
2 weighting factors are selected from the group consisting of:

3 a frame utilization for the corresponding forward
4 communication link and access terminal; and
5 a priority of the data to be transmitted to the
6 corresponding access terminal.

1 22. The communications network of claim 13, wherein the
2 access point is adapted to calculate the scheduling parameter for
3 each of the forward communication links and access terminals as a
4 function of a priority of the data to be sent to the
5 corresponding access terminal.

1 23. The communications network of claim 13, wherein the
2 access point is adapted to calculate a scheduling parameter P_i
3 for an i th access terminal and forward communication link using
4 the following expression:

5
$$P_i = (R_{MAXi} / R_{AVGi}) * U_{FRAMEi};$$

6 wherein P_i = the scheduling parameter for the
7 i th forward communication link
8 for the corresponding i th access
9 terminal;

10 R_{MAXi} = the maximum data transmission
11 rate for the i th forward
12 communication link for the
13 corresponding i th access
14 terminal;

15 R_{AVGi} = the average data transmission
16 rate for the i th forward
17 communication link for the i th
18 corresponding i th access
19 terminal for a predetermined
20 time period; and

21 U_{FRAMEi} = the frame utilization for the i th
22 forward communication link for the
23 corresponding i th access terminal.

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1 24. The communications network of claim 23, wherein the
2 access point is adapted to calculate the frame utilization U_{FRAME1}
3 for the i th forward communication link and access terminal using
4 the following expression:

$$U_{FRAMEi} = DPA_i / PS_i ;$$

6 wherein DPA_i = the size of the data
 7 payload available to send
 8 to the ith access terminal;
 9 and
 10 PS_i = the physical layer packet
 11 size corresponding to R_{MAXi} .

1 25. A computer program for scheduling the transmission of
2 data from an access point to a plurality of access terminals
3 serviced by the access point using the corresponding forward
4 communication links between the access point and the access
5 terminals in a CDMA/HDR communications network, comprising
6 instructions for:

7 the access point calculating a scheduling parameter for
8 each of the forward communication links and access
9 terminals as a function of a plurality of operating
10 parameters; and

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11         the access point scheduling data for transmission to the
12         access terminal having the largest scheduling
13         parameter.

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1 26. The computer program of claim 25, wherein the access
2 point calculates the scheduling parameter for each of the forward
3 communication links and access terminals as a function of a frame
4 utilization for the corresponding forward communication link and
5 access terminal.

1 27. The computer program of claim 26, wherein the frame
2 utilization is calculated as a function of a size of a data
3 payload available to send to the corresponding access terminal
4 and a size of the physical layer packet for the corresponding
5 access terminal.

1 28. The computer program of claim 26, wherein the access
2 point calculates the frame utilization U_{FRAME1} for the i th forward
3 communication link and access terminal using the following
4 expression:

$$U_{FRAMEi} = DPA_i / PS_i;$$

[illegible]

1 29. The computer program of claim 26, wherein the access
2 point calculates the scheduling parameter for each of the forward
3 communication links and access terminals as a function of the
4 frame utilization, a maximum data transmission rate, and an
5 average data transmission rate for the corresponding forward
6 communication link and access terminal.

1 30. The computer program of claim 29, wherein the frame
2 utilization is calculated as a function of a size of a data
3 payload available to send to the corresponding access terminal
4 and a size of the physical layer packet for the corresponding
5 access terminal.

1 34. The computer program of claim 25, wherein the access
2 point calculates the scheduling parameter for each of the forward
3 communication links and access terminals as a function of a
4 priority of the data to be sent to the corresponding access
5 terminal.

[illegible]

6 wherein P_i = the scheduling parameter for the
7 ith forward communication link
8 for the corresponding ith access
9 terminal;

R_{AVGi} = the average data transmission rate for the ith forward communication link for the ith corresponding ith access terminal for a predetermined time period; and

1 36. The computer program of claim 35, wherein the access
2 point calculates the frame utilization U_{FRAMEi} for the i th forward
3 communication link and access terminal using the following
4 expression:

[illegible]

PS_i = the physical layer packet size corresponding to $R_{\text{MAX}i}$.

1 37. A communications network, comprising:
2 a plurality of access terminals;
3 an access point operably coupled to the access terminals by
4 a plurality of corresponding forward communication
5 links;
6 means for calculating a scheduling parameter for each of
7 the forward communication links and access terminals
8 as a function of a plurality of operating parameters;
9 and
10 means for scheduling data for transmission to the access
11 terminal having the largest scheduling parameter.

1 38. The communications network of claim 37, further
2 comprising:
3 means for calculating the scheduling parameter for each of
4 the forward communication links and access terminals
5 as a function of a frame utilization for the
6 corresponding forward communication link and access
7 terminal.

1 39. The communications network of claim 38, further
2 comprising:
3 means for calculating the frame utilization as a function
4 of a size of a data payload available to send to the
5 corresponding access terminal and a size of the
6 physical layer packet for the corresponding access
7 terminal.

1 40. The communications network of claim 38, further
2 comprising:

means for calculating the frame utilization U_{FRAMEi} for the
ith forward communication link and access terminal
using the following expression:

$$U_{FRAMEi} = DPA_i / PS_i;$$

wherein DPA_i = the size of the data
payload available to send
to the ith access terminal;
and
 PS_i = the physical layer packet
size corresponding to a
maximum data transmission
rate for the ith access
terminal.

41. The communications network of claim 38, further
comprising: means for calculating the scheduling parameter
for each of the forward communication links
and access terminals as a function of the
frame utilization, a maximum data
transmission rate, and an average data
transmission rate for the corresponding
forward communication link and access
terminal.

42. The communications network of claim 41, further
comprising:
means for calculating the frame utilization as a function
of a size of a data payload available to send to the
corresponding access terminal and a size of the
physical layer packet for the corresponding access
terminal.

43. The communications network of claim 41, further
comprising:

means for calculating the frame utilization U_{FRAMEi} for the
ith forward communication link and access terminal
using the following expression:

$$U_{FRAMEi} = DPA_i / PS_i;$$

wherein DPA_i = the size of the data
payload available to send
to the ith access terminal;
and
 PS_i = the physical layer packet
size corresponding to a
maximum data transmission
rate for the ith access
terminal.

44. The communications network of claim 37, further
comprising:
means for calculating the scheduling parameter for each of
the forward communication links and access terminals
as a function of one or more weighting factors, a
maximum data transmission rate, and an average data
transmission rate for the corresponding forward
communication link and access terminal.

45. The communications network of claim 44, wherein the
weighting factors are selected from the group consisting of:
a frame utilization for the corresponding forward
communication link and access terminal; and
a priority of the data to be transmitted to the
corresponding access terminal.

46. The communications network of claim 37, further
comprising:
means for calculating the scheduling parameter for each of
the forward communication links and access terminals

5 as a function of a priority of the data to be sent to
6 the corresponding access terminal.

1 47. The communications network of claim 37, further
2 comprising:

3 means for calculating a scheduling parameter P_i for an i th
4 access terminal and forward communication link using
5 the following expression:

$$P_i = (R_{MAXi} / R_{AVGi}) * U_{FRAMEi};$$

7 wherein P_i = the scheduling parameter for the
8 ith forward communication link
9 for the corresponding ith access
10 terminal;

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11          $R_{MAXi}$            =      the maximum data transmission
12                                rate for the ith forward
13                                communication link for the
14                                corresponding ith access
15                                terminal;

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R_{AVGi} = the average data transmission
rate for the ith forward
communication link for the ith
corresponding ith access
terminal for a predetermined
time period; and

22 $U_{\text{FRAME}i}$ = the frame utilization for the i th
23 forward communication link for the
24 corresponding i th access terminal.

1 48. The communications network of claim 47, further
2 comprising:

3 means for calculating the frame utilization U_{FRAMEi} for the
4 i th forward communication link and access terminal
5 using the following expression:

$$U_{FRAMEi} = DPA_i / PS_i;$$

wherein DPA_i = the size of the data payload available to send to the i th access terminal; and
 PS_i = the physical layer packet size corresponding to R_{MAXi} .

[illegible]